



U.S. Department of Transportation
Federal Highway Administration

Priority, Market-Ready Technologies and Innovations

Highway Rail Warning System

Problem: Collisions at railroad crossings cause injury and death

Every year thousands of trains and vehicles collide at railroad crossings. In 2002, these accidents caused 311 deaths and 859 injuries. The increased use of active warning systems could prevent many of these deaths and injuries. However, installing conventional technology at low vehicle-volume railroad crossings in rural areas is cost-prohibitive; it costs an estimated \$100,000 to \$150,000 to upgrade a railroad crossing using conventional technologies. These high costs are because many passive crossings in rural areas are miles from electric power lines.

Putting It in Perspective

- Highway-rail grade crossing collisions occur approximately every 90 minutes in this country.
- A motorist is 40 times more likely to be killed if involved in a vehicle-train crash than in any other type of highway collision.
- In 2002, there were more than 3,000 vehicle-train collisions.
- Crashes at passive crossings are more likely to be fatal than crashes at crossings with active warning systems.
- It would cost approximately \$14 billion to upgrade the 90,000 passive crossings in the United States using conventional technology.

Solution: Save lives with low-cost active warning technologies

What are low-cost active warning systems?

A low-cost active warning system typically consists of locomotive-installed hardware that communicates with railroad crossing warning devices to activate warning signals. The systems now being tested are able to upload and download data on all crossings within radio communication, and can also report on system operations health. Solar/battery powered flashing signs are mounted on standard crossing poles, and the system provides wireless communication between these devices and the train.

Successful Applications: The Minnesota experience

The Minnesota Department of Transportation (DOT), through the State's intelligent transportation systems program, Minnesota Guidestar, is partnering with the Federal Highway Administration (FHWA), the Twin Cities and Western Railroad, and the Federal Railroad Administration to evaluate a low-cost, Highway-Rail Intersection Warning System (HRIWS). The purpose of the study is to determine whether there are additional safety benefits from upgrading passive warning systems to active systems at selected rural railroad crossings. HRIWS:

- Provides automatic feedback about signal condition to the train crew so they can stop the train if signals are not working.
- Eliminates the need for connections to electric power lines through solar technology.
- Eliminates costly testing procedures through self-diagnostics that are triggered with each passing train.
- Avoids use of troublesome and costly track circuits.
- Requires no trackside infrastructure.
- Tracks train location through global positioning systems.

- Allows passing trains and crossing devices to communicate through digital radio receivers to determine whether all warning systems are operational.
- Warns motorists with receivers about approaching trains.
- Supports several trains at a single crossing.

Benefits

- Lower installation costs.
- High system reliability.
- Reduced maintenance costs.
- Designed for rural, low-volume crossings.

Additional Resources

Additional information about the Highway Rail Warning System is available at www.aashtotig.org

For more information, contact:

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